भारतीय मानक
Indian Standard

IS 11032 : 2021

रोटरी स्क्रीन प्रकार के प्री-क्लीनर — विशिष्टि

(पहला पुनरीक्षण)

Rotary Screen Type Pre-Cleaner — Specification

(First Revision)

ICS 65.060.99

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September 2021 **Price Group 2**

Agriculture and Food Processing Equipment Sectional Committee, FAD 20

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards after the draft finalized by the Agriculture and Food Processing Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

Cleaning of seeds/grains is an important processing operation which upgrades the quality of seeds/grains and raises its value. Manual sieving is a common method of cleaning seeds/grains in the seeds processing plant and grain market/mandies. This process is time consuming and also expensive. Mechanical cleaning is fast, precise and economical, vibratory sieve type cleaners, which have been used so far, were found out suitable for cleaning grains prior to procurement in grain markets due to their low output in relation to the energy consumption per unit mass. Rotary type pre-cleaner are most suitable for slow moving seeds/grains like ground nut pods, fuzzy cotton seeds, seeds/grains with high percentage of impurities. Rotary screen type pre-cleaners were developed to overcome these problems and this type of pre-cleaners are being manufactured and used in the country. The need was, therefore felt to prepare an Indian Starboards to guide the manufacturers and the users for production and procurement of quality pre-cleaners.

This standard was first published in 1984. The first revision has been taken up to keep pace with the latest technological developments and international practices. In this revision following major changes have been made:

a) Number of screens has updated as per the latest practices; and

b) The material of the screen has been updated.

The composition of the Committee, responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 ‘Rules for rounding off numerical values (*revised*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ROTARY SCREEN TYPE PRE-CLEANER — SPECIFICATION

(First Revision)

1 SCOPE

This standard specifies material, construction, performance and other requirements of rotary screen type Seeds/grain pre-cleaners.

2 REFERENCES

The standards listed below contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. In case the standards are to be referred in this clause they are to be listed as follows:

IS No.	*Title*
2385 : 1977	Hot-rolled mild steel sheet and strip in coil form for cold-reduced tinplate and cold-reduced blackplate
277 : 2018	Galvanized steel strips and sheets (plain and corrugated) — Specification (*seventh revision*)
5718 : 2000	Agricultural produce processing equipment — Seed cleaners — Test code
18440 : 1977	Test code for paddy cleaners
I8132 : 1999 ISO 3600	Tractors and machinery for agriculture and forestry, powered lawn and garden equipment — Operator’s manuals — Content and presentation

3 TYPES

For the purpose of this standard, the rotary screen type pre-cleaners shall be following two types:

a) Single — Screen type, and

b) Multiple — Screen type (up to 4 screens).

4 MATERIAL

The material used for various components of the cleaner (Fig. 1) shall be mild steel as per IS 2385 or galvanized steel as per IS 277.

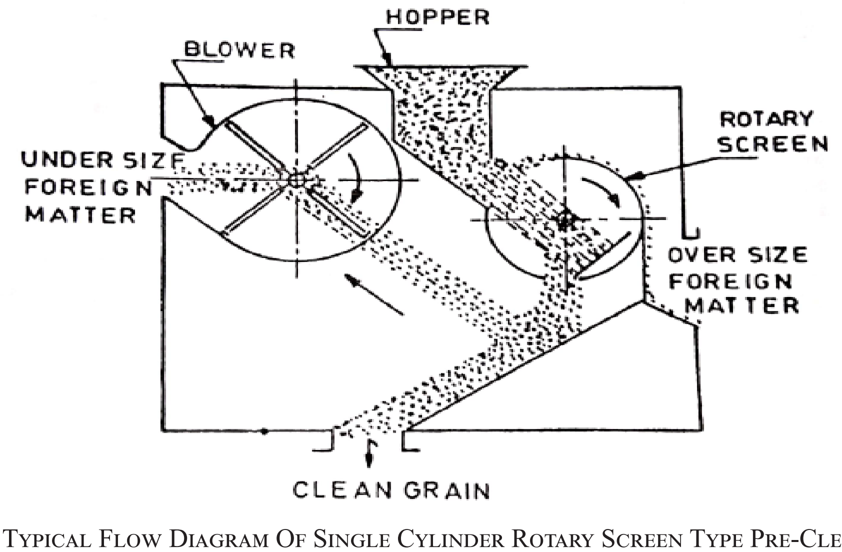

FIG. 1 TYPICAL FLOW DIAGRAM OF SINGLE CYLINDER ROTARY SCREEN TYPE PRE-CLEANER

NOTE — Raw materials such as unhusked/unmilled grains which are in contact with mild steel must not be directly consumed.

5 CONSTRUCTIONAL REQUIREMENTS

5.1 Frame — The frame shall be made of suitable size mild steel/galvanized steel channels/angles/sections or fabricated out of 3 mm thickness or more galvanized steel sheet and shall be covered with mild steel sheet/galvanized steel sheet of thickness 2.0 mm or more depending on number of perforated cylinders in the pre-cleaner.

5.2 Hopper — Hopper made of mild steel angles and mild steel sheets shall be provided with a feed regulating device. The minimum thickness of the sheet used for the hopper shall be 2.0 mm or more depending on number of cylinders used.

5.3 Rotary Screen — One or multiple perforated rotary screens depending on the number of cylinders shall be used. In case of single screen, the cylinder screen shall rotate in clockwise direction. In case of multiple cylinders, the cylinder screen shall rotate in counter clock wise direction. The speed of rotation of cylinders will be variable. The inclination of the cylinder shall also be made variable to clean different types of seeds/grains effectively.

5.4 Blower — The blower shall be provided to prevent with the control lever or VFD (Variable Frequency Drive) to regulate air flow rate. There may be pre and post air controls if Pre-cleaner is provided with two aero-dynamic chambers one located at seeds grains falling on the first rotating screen cylinder and second at the exit of cleaned seeds/grains.

5.5 Transmission Drive — The suitable drive system like geared motor or sprocket chain or V belt pulley system for transmitting the power shall be provided in the pre-cleaner machine.

5.5.1 Suitable transmission guards shall be provided to prevent accidents due to contact with moving part of the machine with human beings while in operation.

5.5.2 The guards shall not hinder the operations of the machines even while making adjustments available in the machines.

5.5.3 It is preferable that all the guards shall be either permanently attached or firmly secured to prevent its removal without the aid or tools. The servicing and adjustment should be possible without removal of the guards.

5.5.4 The guards shall have sufficient strength to support load at any point during the operation.

5.6 Shafts — The shafts shall be supported with suitable bearings and housings on the stable part of machine.

6 PERFORMANCE REQUIREMENTS

6.1 The Pre-cleaner shall be operated at no load in accordance with the method given in **8** of IS 5718. During the no load run of the pre-cleaner, the visual observation shall not show the following abnormalities:

a) Presence of any marked vibrations during operation;
b) Presence of undue knocking or rattling sound;
c) Frequency slippage of belts;
d) Non-smooth running of shafts in the bearing housings;
e) Any marked wear or slackness in any components;
f) Any marked rise in temperature of operational bearings and its housing;
g) Vibrations in running blowers; and
h) No mechanical damage to any components of pre-cleaners.

6.2 The rated input capacity in tons/hr and rated energy consumption in kW/tonne for raw seeds/grains with 10 to 20 percent impurities like chaff, dust, soil particles, discoloured seeds/grains, cut and damage seeds/grains, for Wheat and Paddy shall be declared when tested in accordance with the method given in clause **8** and **9** of IS 5718 or clause **7** and **8** of IS 8440. The declared value shall not differ by 5 percent. The cleaning efficiency shall not be less than 90 percent. It means 90 percent impurities will be separated by pre-cleaner from the seeds/Grains.

6.2.1 During and after capacity test, the visual observations shall not indicate the following abnormalities;

a) Observations given under 5.1 (a) to (g);
b) No smooth flow of material through different components;
c) Any marked wear, deformation and bread-down;
d) Frequent loosening of fasteners; and
e) Leakage of seeds/grains from the cleaner while in operation.

6.2.2 Pre-cleaner when testes in accordance with **8.2** of IS 8440, there shall not be any break down of parts in the cleaner machine.

7 OTHER REQUIREMENTS

7.1 Provision for belt tightening shall be provided.

7.2 Arrangement for lubrication of bearings shall be provided.

7.3 Provision for easy transportation or towing with tractor shall be provided. Loading lugs shall also be provided for easily lifting of machine.

7.4 The cleaner shall be provided with the operator's manual (*see* **4.2** of IS 8132)

8 WORKMANSHIP AND FINISH

8.1 Welding used for joining components shall not be porous.

8.2 Any sharp corners and protruding fasteners shall be avoided.

8.3 Components shall be free from cracks, pits, burrs and other visual defects which may be detrimental for its use.

8.4 All the components of machine shall be painted with the rust preventive paints like rust proof red oxide. If welded joints are not used for fabrication of machine components, then all components shall be Galvanized Steel bolt joints.

9 MARKING AND PACKING

9.1 Marking

Each shall be marked with the following essential information;

a) Manufacturer's name and registered trade mark;
b) Make, model, serial number of machine etc;
c) Motor HP/kW, phase, power rating etc;
d) Rated input capacity of machine;
e) Contact address and number, email etc; and
f) Year of manufacture of machine.

9.2 Packing

The cleaner shall be packed for safety and security of human being while in transit and as agreed to between the purchaser and supplier for safe handling in transit.

10 SAMPLING AND TESTS

10.1 At least one cleaner of a particular type and model shall be tested under type testing as requirement of these specifications.

10.2 Each cleaner shall be tested under routine testing for the following features:

a) Requirements given under clause **7**, **8**, and **10**; and
b) Performance requirements as given under **6**.

10.3 Acceptance of machine from the lot in factory for testing as sample, the sampling and criteria for conformity shall be as agreed to between the purchaser and the supplier.

11 BIS CERTIFICATION MARKING

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A

(*Foreword*)

COMMITTEE COMPOSITION

Agriculture and Food Processing Equipments, FAD 20

Organization	*Representative(s)*
Indian Council of Agricultural Research, New Delhi	Dr K. Alaglusundaram (***Chairman***)
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Dr Panjabro Deshmukh Krishi Vidyapeeth, Akola	Dr P. A. Borkar
Essen Multipack Limited, Rajkot	Shri Shaildip Wagh
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ICAR-Central Institute for Research on Cotton Technology, Mumbai	Dr V. G. Arude
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Member Secretary

Shri Pawan Kumar
Scientist 'C' (FAD), BIS

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc No.: FAD 20 (14189).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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Published by BIS, New Delhi